REMARKS/ARGUMENTS

Claims 1-16 were previously pending in the application. New claims 17-19 are added herein. Assuming the entry of this amendment, claims 1-19 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In paragraph 2 of the office action, the Examiner rejected claims 1-16 under 35 U.S.C. 103(a) as being unpatentable over Takaki in view of Chalmers. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over the cited references.

Claims 1 and 9

Claim 1 is directed to a method for processing a received analog spread-spectrum signal in a spread-spectrum receiver. A determination is made whether to attenuate the received analog spread-spectrum signal. Based on the attenuation determination, the received analog spread-spectrum signal is selectively attenuated to generate a selectively attenuated analog spread-spectrum signal. The selectively attenuated analog spread-spectrum signal is digitized to generate a digital spread-spectrum signal. The digital spread-spectrum signal is filtered in an attempt to compensate for interference in the received analog spread-spectrum signal to generate a filtered digital spread-spectrum signal. The filtered digital spread-spectrum signal is de-spread to generate a de-spread digital signal. The attenuation determination is based on the amplitude of the digital spread-spectrum signal prior to the interference-compensation filtering and the de-spreading.

Fig. 6 shows an exemplary embodiment of a spread-spectrum receiver capable of performing the method of claim 1. As shown in Fig. 6 and as described in the text on page 3 of the specification:

- Mixer **604** downconverts input signal **602** from RF to IF;
- Variable attenuator **614** selectively attenuates IF signal **608** to generate an attenuated IF signal **616**. Variable attenuator **614** implements an example of the selective attenuation step of claim 1;
- ADC **618** converts the analog IF signal into a digital IF signal **620**. ADC **618** implements an example of the digitizing step of claim 1;
- Digital downconverter **624** downconverts digital IF signal **620** into a digital baseband signal **626**.
- Digital filter **628** filters digital baseband signal **626** to generate filtered baseband signal **630**. Digital filter **628** implements an example of the filtering step of claim 1;
- Digital processing **632** despreads and demodulates the filtered baseband signal **630**. Digital processing **632** implements an example of the de-spreading step of claim 1; and
- Controller **612** determines the amplitude of digital IF signal **620** (prior to the filtering of digital filter **628** and the de-spreading of digital processing **632**) and controls variable attenuator **614** based on that determined amplitude. Controller **612** implements an example of the attenuation determination step of claim 1, which is based on the

amplitude of the digital spread-spectrum signal prior to the filtering and de-spreading of claim 1.

Takaki teaches a radio receiver for a spread-spectrum signal. Of most relevance to the Examiner's rejection of claim 1, as shown in Figs. 3 and 6 of Takaki:

- Variable attenuator **3** attenuates analog RF signal **S2** (see, e.g., column 6, lines 22-25);
- Mixer **6** converts attenuated analog RF signal **S5** into analog IF signal **S6** (see, e.g., column 6, lines 33-37);
- Quadrature demodulator **10** converts analog IF signal **S8** into digital baseband I and Q component signals **S9** and **S10** (see, e.g., column 6, lines 44-50);
- Demodulator **12** de-spreads signals **S9** and **S10** to generate information signal **S11** (see, e.g., column 6, lines 51-53, and Fig. 6, steps **58** and **62**);
- Error-rate calculator **15** calculates the bit-error rate of information signal **S11** and provides signal **S20** to controller **16** (see, e.g., column 6, lines 54-57);
- FFT analyzer **13** converts time-domain digital baseband I and Q component signals **S9** and **S10** into frequency-domain signal **S16** (see, e.g., column 6, lines 62-65);
- Jamming-wave detector **14** analyzes frequency-domain signal **S16** to determine whether a jamming wave exists and provides signal **S17** to controller **16** (see, e.g., column 6, line 66, to column 7, line 2, and Figs. 4-5); and
- Controller **16** controls the gain of variable attenuator **3** (see, e.g., column 7, lines 8-10). In particular, controller **16** determines whether or not to change the gain of variable attenuator **3** based on the results of the FFT analysis performed by FFT analyzer **13** and jamming-wave detector **14** (see, e.g., Fig. 6A, steps **53** and **54**; and column 8, lines 13-15). If a jamming wave is detected, then controller **16** continues to changes the gain of variable attenuator **3** until the bit-error rate is at an acceptable level (see, e.g., Fig. 6B, steps **56-60**; and column 8, lines 33-67).

In rejecting claim 1, the Examiner concluded that:

- Takaki's controller **16** implements an example of the attenuation determination step of claim 1;
- Takaki's attenuator **3** implements an example of the selective attenuation step of claim 1; and
- Takaki's quadrature demodulator **10** implements an example of the digitizing step of claim 1.

The Examiner admitted that Takaki does not teach an example of the filtering step of claim 1. Instead, the Examiner cited Chalmers as teaching the filtering step of claim 1. The Examiner also cited Chalmers as teaching the de-spreading step of claim 1. For the following reasons, the Applicant submits that the combination of Takaki and Chalmers does not provide the invention of claim 1.

On page 3, the Examiner stated that it would have been "obvious to one skilled in the art to modify Chalmers to filter the digital spread-spectrum signal for the benefit of eliminating the alias noise." The Applicant assumes that the Examiner intended to refer to "Takaki" instead of "Chalmers" in this statement. The Applicant requests confirmation of the accuracy of this assumption or clarification if the assumption is not correct.

According to claim 1, the digital spread-spectrum signal is filtered "in an attempt to compensate for interference in the received analog spread-spectrum signals." As described by the Examiner, Chalmers' filter is designed to eliminate alias noise. Chalmers' alias noise is a characteristic of <u>digital</u> signals, <u>not</u> <u>analog</u> signals. See, e.g., column 8, lines 21-23. A filter designed to eliminate alias noise in a <u>digital</u> signal is <u>not</u> a filter that attempts to compensate for interference in a received <u>analog</u> spread-spectrum signal.

In rejecting claim 1, the Examiner cited column 8, lines 19-28, of Chalmers as teaching "filtering the digital spread-spectrum signal in an attempt to compensate for interference in the received analog spread-spectrum signal." In fact, the cited passage in Chalmers has <u>nothing</u> to do with interference in a received <u>analog</u> spread-spectrum signal. Rather, the cited passage relates to alias noise in a <u>digital</u> signal generated by sampling an analog signal. The alias noise does <u>not</u> exist in the <u>analog</u> signal; it is created in the process of generating the digital signal. Thus, the Applicant submits that the Examiner mischaracterized the teachings of Chalmers in rejecting claim 1.

Thus, even if it were proper to combine the teachings of Takaki and Chalmers, which the Applicant does not admit, the fact remains that the combination of those teachings does <u>not</u> provide the invention of claim 1 because the combination does <u>not</u> teach or even suggest a filter that attempts to compensate for interference in a received <u>analog</u> spread-spectrum signal.

For all these reasons, the Applicant submits that claim 1 is allowable over the cited references. For similar reasons, the Applicant submits that claim 9 is allowable over the cited references. Since the rest of the claims depend directly or indirectly from claims 1 and 9, it is further submitted that those claims are also allowable over the cited references.

<u>Claims 2 and 10</u>

In rejecting claim 2, the Examiner cited column 6, lines 30-32, of Chalmers as teaching "the filtering attempts to compensate for off-channel interference in the received analog spread-spectrum signal." The Applicant submits that the cited passage has nothing to do with such filtering. The Applicant submits that this provides additional reasons for the allowability of claim 2 and similarly for the allowability of claims 8, 10, and 16 over the cited references.

<u>Claims 3 and 11</u>

According to claim 3, the selectively attenuated analog spread-spectrum signal has a negative signal-to-noise ratio (SNR). As explicitly defined in the specification on page 4, lines 23-24, a negative SNR is when the noise level <u>is larger than</u> the desired signal level. In rejecting claim 3, the Examiner cited column 1, lines 13-24, of Takaki. Nowhere in this passage does it teach that the noise level is larger than the desired signal level. Takaki's Fig. 4 is the only teaching found by the Applicant that is indicative of the magnitude of the noise level relative to the desired signal level. Clearly, in Fig. 4, the noise level is <u>not</u> larger than the desired signal level. The Applicant submits that this provides additional reasons for the allowability of claim 3 and similarly for the allowability of claims 8, 11, and 16 over the cited references.

Claims 4 and 12

According to claim 4, the received analog spread-spectrum signal is attenuated when the amplitude of the digital spread-spectrum signal is greater than an upper threshold. Claim 4 recites further that the received analog spread-spectrum signal is not attenuated when the amplitude of the digital spread-spectrum signal is less than a lower threshold, wherein the upper threshold is greater than the lower threshold. In rejecting claim 4, the Examiner cited Figs. 4 and 5; column 7, line 64, to column 8, line 4; column 8, lines 17-21; and column 8, lines 33-36, of Takaki. These teachings in Takaki are related to the use of a single threshold P_{TH}. Tthere is simply no teaching or even suggestion in Takaki for the use of upper and lower thresholds, where the upper threshold is greater than the lower threshold. The Applicant submits that this provides additional reasons for the allowability of claim 4 and similarly for the allowability of claims 8, 12, and 16, as well as claims 5 and 13, which depend from claims 4 and 12, respectively, over the cited references.

Claims 5 and 13

According to claim 5, the upper threshold is greater than the lower threshold by an amount greater than the level of selective attenuation in order to provide hysteresis in the attenuation determination. In rejecting claim 5, the Examiner cited Fig. 6 and column 8, lines 53-67, of Takaki as teaching these recited features. The Applicant submits that the cited teachings in Takaki have absolutely nothing to do with such features. In fact, the term "hysteresis" does not even appear anywhere in Takaki. The Applicant submits that this provides additional reasons for the allowability of claim 5 and similarly for the allowability of claims 8, 13, and 16 over the cited references.

New Claim 17

According to new claim 17, the attenuation determination is independent of any determination of bit error rate. Since, in Takaki, the attenuation determination is a function of the calculated bit-error rate (see, e.g., Fig. 6B, steps **59**-**60**), the Applicant submits that this provides additional reasons for the allowability of new claim 17 over the cited references.

New Claim 18

According to new claim 18, the attenuation determination is based on the amplitude of the digital spread-spectrum signal in a time domain. Since, in Takaki, the attenuation determination is based on analyzing the signal in the frequency domain (see, e.g., Figs. 4-5), the Applicant submits that this provides additional reasons for the allowability of new claim 18 over the cited references.

New Claim 19

According to new claim 19, the attenuation determination is based on the amplitude of the digital IF signal. In Takaki's Fig. 3, attenuation determination is performed using the digital baseband component signals I and Q, not a digital IF signal. The Applicant submits that this provides additional reasons for the allowability of new claim 19 over the cited references.

Conclusion

For the reasons set forth above, the Applicant respectfully submits that the rejections of claims 1-16 under Section 103(a) have been overcome. Furthermore, new claims 17-19 patentably define over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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